



Cambridge International AS & A Level

PHYSICAL EDUCATION

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Paper 1

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MARK SCHEME

Maximum Mark: 90

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This document consists of **15** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science-Specific Marking Principles

1 Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.

2 The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.

3 Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).

4 The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.

5 'List rule' guidance

For questions that require *n* responses (e.g. State **two** reasons ...):

- The response should be read as continuous prose, even when numbered answer spaces are provided.
- Any response marked *ignore* in the mark scheme should not count towards *n*.
- Incorrect responses should not be awarded credit but will still count towards *n*.
- Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response.
- Non-contradictory responses after the first *n* responses may be ignored even if they include incorrect science.

6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

Question	Answer	Marks
1(a)	3 marks for: 1 concentric AND muscle shortens AND upward phase; 2 eccentric AND muscle lengthens AND downward phase; 3 isometric AND muscle stays same length AND stationary phase;	3
1(b)	8 marks for: 1 ball and socket; 2 humerus AND scapula; 3 flexion; 4 deltoid; 5 condyloid; 6 radius AND carpals (Accept one named carpal.); 7 flexion; 8 wrist flexor(s) (Accept one named wrist flexor.);	8
1(c)	6 marks for any 6 of: 1 controlled by cardiac (control) centre / medulla; 2 chemoreceptors detect increased CO ₂ / acidity / lactic acid levels / reduction in pH / decreased O ₂ ; 3 proprioceptors / mechanoreceptors detect increased movement; 4 baroreceptors detect changes in blood pressure; 5 thermoreceptors detect increase in temperature; 6 (increased) venous return / blood flow back to heart / Starling's law; 7 (increased) sympathetic nervous impulses; 8 (increased) release of adrenaline / noradrenaline; 9 reduced parasympathetic nervous impulses; 10 reduced release of acetylcholine; 11 (increased) sinoatrial node firing;	6

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Question	Answer	Marks
1(d)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 (from lungs) via pulmonary veins; 2 to left atrium; 3 through bicuspid / atrioventricular / mitral valve; 4 into left ventricle; 5 through semilunar / aortic valve; 6 to aorta; 7 through other arteries / arterioles; 8 (supplies muscles) via capillaries; <p>Answers must be in appropriate sequence.</p>	4
1(e)(i)	<p>2 marks for any 2 of:</p> <ol style="list-style-type: none"> 1 (goblet) cells secrete mucus which traps debris; 2 cilia / ciliated epithelia which move / waft mucus / debris (towards larynx / mouth swallowed / coughed out); 3 (incomplete / c-shaped) rings of cartilage which keep trachea open; 4 layer of (smooth) muscle which allows trachea to narrow during swallowing and coughing; 	2
1(e)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 large blood supply / large capillary network; 2 thin walls / one cell thick; 3 semi-permeable membrane; 4 short distance for diffusion / between membranes; 5 layer of moisture; 6 slow blood flow / long transit time; 	3

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Question	Answer	Marks
1(f)	4 marks for any 4 of: 1 causes increase in frequency of breathing / ventilation rate / breathe faster; 2 reduced air / atmospheric pressure; 3 partial pressure of oxygen / pO ₂ in air is lower / reduced; 4 reduced / lower concentration / diffusion gradient of oxygen in alveoli / lungs / between alveoli and blood; 5 less oxygen diffuses into blood / capillaries / combines with haemoglobin / forms oxyhaemoglobin; 6 reduces / lower concentration / diffusion gradient of oxygen at muscles / less oxygen diffuses into muscle / myoglobin; 7 carbon dioxide builds up at faster rate; 8 reduced performance for aerobic / endurance events; 9 improved performance for speed / power events;	4

Question	Answer	Marks
2(a)	4 marks for any 4 of: 1 motor ability identified, e.g. coordination; 2 needed as foundation / basis to build skill learning / building block; 3 fundamental motor skill identified, e.g. kicking / running; 4 needs practice / repetition / reinforcement of movement to help sport-specific skill learning; 5 sport specific skill identified e.g. passing / dribbling in football; 6 this gets developed / refined / adapted / through teaching / coaching / guidance / feedback;	4

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Question	Answer	Marks
2(b)(i)	5 marks for any 5 of: 1 make sure performer is paying attention / can see / focussed / not distracted; 2 make demonstration accurate / perfect demonstration; 3 make demonstration meaningful / relevant / realistic / succinct; 4 use a role model / significant other / peer to demonstrate; 5 demonstrate slowly / in slow motion; 6 highlight cues / include verbal guidance as well as demonstration; 7 repeat the demonstration; 8 break down / simplify skill; 9 allow time for mental rehearsal; 10 make sure performer is capable of performing skill; 11 allow practice as soon as possible after demonstration; 12 make sure performer wants / is motivated to learn;	5
2(b)(ii)	2 marks for: 1 'understanding' the whole process to achieve the result / wholeness / holistic approach; 2 cognitive / Gestalt theory;	2
2(b)(iii)	2 marks for any 2 of: 1 better than learning skills in isolation; 2 helps to identify role in activity; 3 allows learners to develop their own strategies / routes of understanding / learn own corrections; 4 better than being told what to do all the time; 5 speeds up learning; 6 enhances motivation;	2

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Question	Answer	Marks
2(c)(i)	<p>4 marks for any 4 of:</p> <p>Max. 3 marks without example: e.g. suitable example such as triple jump, tennis serve, high jump.</p> <ol style="list-style-type: none"> 1 series of subroutines; 2 suitable example of subroutines; 3 generalised series of movements; 4 set of neural commands / nerve impulses to muscles; 5 completed in correct order; 6 brought about by making one decision OR first movement initiates (whole) motor programme; 7 established by rehearsal / practice / overlearning / training / grooved / autonomous / habitual / well-learned / recalled easily; 8 stored in long-term memory; 9 run from short-term memory; 	4
2(c)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 memory trace initiates movement; 2 involves detection of (intrinsic) feedback during movement; 3 performer able to adjust / correct the movement; 4 by comparison with perceptual trace; 5 updates memory trace; 	3
2(d)(i)	<p>2 marks for:</p> <ol style="list-style-type: none"> 1 the (sporting) environment; 2 suitable example of information, e.g. cues such as opponents / ball / crowd / scoreboard; 	2

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Question	Answer	Marks
2(d)(ii)	<p>4 marks for any 4 of:</p> <p>(perception)</p> <ol style="list-style-type: none"> 1 interprets / judges / makes sense of information; 2 involves DCR process / use of memory; 3 selective attention occurs; <p>(feedback)</p> <ol style="list-style-type: none"> 1 reinforces / causes repeat of successful movements; 2 corrects / alters / adjusts inappropriate movements; 3 motivates / boosts / encourages persistence; 	4
2(e)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 number of stimuli / number of possible alternative responses / number of decisions to be made / open / complex / externally paced skills slow reaction time; 2 psychological refractory period / single-channel hypothesis slows reaction time; 3 distractions / inability to selectively attend / focus slows reaction time; 4 age / senses deteriorating slows reaction time; 5 (gender) females tend to have slower reaction time; 6 low level of personal fitness / poor health / injury slows reaction time; 7 length of neural pathways / height slows reaction time; 8 past experience / presence of motor programmes / high level of skill / ability quickens reaction time; 9 relevant environmental factors, e.g. poor weather / low temperature slows reaction time; 10 consumption of alcohol slows reaction time; 11 drugs / medications / stimulants affect reaction time; 12 lack of sleep slows reaction time; 13 optimal level of arousal / anxiety / stress / alertness quickens reaction time; 14 bright / loud / intense stimulus quickens reaction time; 15 anticipation quickens reaction time; 16 lack of hydration slows reaction time; <p>Accept opposites.</p>	4

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Question	Answer	Marks
3(a)(i)	3 marks for any 3 of: 1 time when all other obligations / work / family are met / spare time; 2 freely chosen activity / choice; 3 activity done for self-realisation / personal development / self-expression / well-being / relaxation / relieve stress / escape from reality; 4 activity done for pleasure / fun / enjoyment; 5 activity takes place in a cultural setting / varies across cultures; 6 involvement depends on economics / as an economic product; 7 may be used as a form of social control;	3
3(a)(ii)	2 marks for: 1 (privilege) reason for choice of activity depends on social class / cost / education; 2 (purposefulness) reason for choice of activity is that it has a role in society OR a role for individual achievement / fulfilment / improvement;	2

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Question	Answer		Marks
3(b)	3 marks for any 3 of:		3
	play	sport	
	1 limited organisation / spontaneous	highly organised / structured numbers / roles of participants / playing area / time constraints;	
	2 for its own sake / involves no ulterior motive / intrinsic	more competitive / concerned with winning / extrinsic rewards;	
	3 simple / few rules	complex / many / written rules;	
	4 rules agreed / decided prior to participation	predetermined rules;	
	5 rules can be changed as play progresses	rules are accepted / adhered to / fixed for the duration of the activity;	
	6 non-standard facilities / equipment	standardised equipment / facilities;	
	7 no officials	use of officials;	
	8 non-serious / lower standards	serious / selection / higher standards;	

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Question	Answer	Marks
3(c)	<p>5 marks for any 5 of:</p> <p>Answers must describe policies, provision and administration etc.</p> <ol style="list-style-type: none"> 1 described government initiatives; 2 described National Governing Body / sport-specific initiatives; 3 described other (named) initiatives; 4 selection procedures / talent-identification programmes; 5 use of specialist schools / colleges / universities; 6 specialist training venues / training camps / centres of excellence; 7 elite coaching structure; 8 role of 'World Class' / development programmes / training programmes / scholarships; 9 structured levels of competition; 10 role of schools / clubs / local / regional governing bodies; 11 medical support structures / medical / physiotherapy / equivalent; 12 scientific support structures / sports science / fitness / conditioning / biomechanics / equivalent; 13 other support structures / nutritionist / media training / equivalent; 14 funding methods for performers; 	5
3(d)	<p>5 marks for any 5 of:</p> <ol style="list-style-type: none"> 1 improve fitness / physical health; 2 improve mental health; 3 become skilful / knowledgeable; 4 enjoyment / intrinsic; 5 achieve satisfaction of success / strive to achieve high standards / improve self-esteem / confidence; 6 personal challenge of competition; 7 socialising / be part of a team / learn life skills, e.g. leadership / social health; 8 possibility of earning a living; 9 fame / praise / medals / status; 10 keep out of trouble / hobby; 11 socialisation / learning cultural values, e.g. values / ethics; 	5

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Question	Answer	Marks
3(e)	<p>6 marks for 6 of:</p> <p>(voluntary) sub-max. 4 marks</p> <ol style="list-style-type: none"> 1 run by members / committee / AGM / unpaid volunteers; 2 possibly on trust / charity basis; 3 financed by members fees / fundraising / sponsorship / money placed back into club; 4 runs on profit-loss but profit not an overriding concern; 5 provide for grass roots of sport; 6 aims to increase participation / performance in their sport / look for talent; 7 meet up with people with similar interests; <p>(public) sub-max. 4 marks</p> <ol style="list-style-type: none"> 1 business operations run by local authority departments / local council; 2 trading on set prices / charges / according to pre-set budget; 3 may involve subsidies as a matter of policy / council tax / equivalent. 4 managed by local authority employees; 5 move to private management / Compulsory Competitive Tendering / Best Value; 6 facilities may not be as well-equipped (due to lack of funds); 7 can be a need for membership OR pay as you go; 	6

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Question	Answer	Marks
3(f)	<p>6 marks for 6 of:</p> <p>(positives) sub-max. 4 marks</p> <ol style="list-style-type: none"> 1 increased access to watch sport / live coverage; 2 increased range of sports available; 3 inform about / increased knowledge of sport(s); 4 encourages people to meet up to watch matches; 5 see higher standards of performance / competition; 6 high-quality stadia / facilities means more comfort / enjoyment; 7 enhanced viewing experience / interactive technology; 8 creates role models / increased knowledge of performer; 9 rules changed to become more exciting spectacle; 10 influenced elimination of negative aspects of sport, e.g. hooliganism / violence / responsible reporting; <p>(negatives) sub-max. 4 marks</p> <ol style="list-style-type: none"> 1 events moved and scheduled depending on prime time / highest viewing figures; 2 event interrupted to accommodate adverts / commercial breaks; 3 spectators may not like format / rule changes; 4 increased cost / ticket prices / pay-to-view / satellite / cable TV; 5 merchandise expensive / replica kit frequently changed; 6 irresponsible reporting / media coverage / fake news can lead to negative feelings / spectator violence / deviant behaviour; 7 fewer live spectators giving less atmosphere; 8 win-at-all cost ethic created due to commercialisation makes spectating less enjoyable; 	6